

AMENDMENTS TO THE CLAIMS

The claims in this listing will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A scanning optical system for dynamically deflecting a laser beam emitted from a light source by a deflecting system, converging the dynamically deflected laser beam by an imaging optical system into a spot beam on a scan target surface, and thereby scanning the spot beam in a main scanning direction on said scan target surface, the scanning optical system comprising:

an optical element ~~being placed positioned~~ on an optical path between said light source and said deflecting system,

said optical element including:

a central area ~~transmitting~~ configured to transmit part of the laser beam ~~in at the vicinity of~~ a central axis of the laser beam;

at least one light blocking area ~~blocking~~ configured to block part of the laser beam incident on part of said optical element outside said central area; and

at least one light transmitting area ~~transmitting~~ configured to transmit part of the laser beam incident on part of said optical element other than said central area and said light blocking area.

2. (Original) The scanning optical system according to claim 1, wherein said central area and said at least one light transmitting area give the same phase to beams passing therethrough.

3. (Original) The scanning optical system according to claim 1, wherein said optical element includes a pair of said light blocking/transmitting areas.

4. (Currently Amended) The scanning optical system according to claim 3,
wherein each of said at least one light blocking area areas is placed positioned
outside and adjacent said central area to adjoin thereto,

wherein each of said at least one light transmitting area areas is placed positioned
outside and adjacent said at least one light blocking area to adjoin thereto.

5. (Currently Amended) The scanning optical system according to claim 4, wherein
each of said at least one light blocking area and said at least one light transmitting area is
placed to be positioned on both sides of said central area in regard to the main scanning
direction.

6. (Currently Amended) The scanning optical system according to claim 5, wherein
each of said at least one light blocking area and said at least one light transmitting area is
placed symmetrically positioned with respect to said central area in regard to the main
scanning direction.

7. (Original) The scanning optical system according to claim 3, wherein a cross
section of the laser beam incident on said optical element taken along a plane
perpendicular to the central axis has an elliptical form.

8. (Original) The scanning optical system according to claim 7, wherein the elliptical
cross section of the laser beam has its major axis in the main scanning direction.

9. (Currently Amended) The scanning optical system according to claim 3, wherein
a distance "ha1" between the central axis of the laser beam incident on said optical
element and an inner edge of said light blocking area measured in the main scanning
direction, a distance "ha2" between the central axis of the laser beam and an outer edge of
said light blocking area measured in the main scanning direction, and a radius "hmax" of a

cross section of the laser beam incident on said optical element measured in the main scanning direction satisfy a condition relationship:

$$0.70 < ((ha1 + ha2)/2)/hmax < 0.85 \quad - (1) -$$

10. (Original) The scanning optical system according to claim 1, wherein said optical element includes two or more pairs of said light blocking/transmitting areas.

11. (Original) The scanning optical system according to claim 10, wherein said light blocking areas and said light transmitting areas are arranged alternately outward from said central area.

12. (Original) The scanning optical system according to claim 11, wherein said light blocking areas and said light transmitting areas are arranged alternately in regard to the main scanning direction.

13. (Currently Amended) The scanning optical system according to claim 12, wherein each of said light blocking areas is placed symmetrically positioned with respect to said central area in regard to the main scanning direction.

14. (Currently Amended) The scanning optical system according to claim 12, wherein each of said light transmitting areas is placed symmetrically positioned with respect to said central area in regard to the main scanning direction.

15. (Original) The scanning optical system according to claim 10, wherein a cross section of the laser beam incident on said optical element taken along a plane perpendicular to the central axis has an elliptical form.

16. (Original) The scanning optical system according to claim 15, wherein the elliptical cross section of the laser beam has its major axis in the main scanning direction.

17. (Currently Amended) The scanning optical system according to claim 14, wherein a distance "hb1" between the central axis of the laser beam incident on the optical element and an inner edge of an outermost one of said light blocking areas measured in the main scanning direction, a distance "hb2" between the central axis of the laser beam and an outer edge of the outermost light blocking area measured in the main scanning direction, and a radius "hmax" of a cross section of the laser beam incident on said optical element measured in the main scanning direction satisfy a condition relationship:

$$0.85 < ((hb1 + hb2)/2)/hmax < 0.95 \quad -(2).$$

18. (Currently Amended) The scanning optical system according to claim 17, wherein a distance "hc1" between the central axis of the laser beam incident on the optical element and an inner edge of an innermost one of said light blocking areas measured in the main scanning direction, a distance "hc2" between the central axis of the laser beam and an outer edge of the innermost light blocking area measured in the main scanning direction, and the radius "hmax" of the cross section of the laser beam measured in the main scanning direction satisfy a condition relationship:

$$0.65 < ((hc1 + hc2)/2)/hmax < 0.75 \quad -(3).$$

19. (Currently Amended) The scanning optical system according to claim 17, wherein said scanning optical system satisfies a condition relationship:

$$0.20 < Sa/(Sa + Sb) < 0.75 \quad -(4)$$

where Sa represents a size of a portion of the innermost one of said light blocking areas, the laser beam being incident on the innermost one of said light blocking areas within the portion of the innermost one, and Sb represents a size of a portion of the outermost one of

said light blocking areas, the laser beam being incident on the outermost one of said light blocking areas within the portion of the outermost one.

20. (Currently Amended) The scanning optical system according to claim 1, wherein said scanning optical system satisfies a condition relationship:

$$0.03 < S'/S < 0.30 \quad -(5)$$

where S' represents a size of a portion of said at least one light blocking area, the laser beam being incident on said at least one light blocking area within the portion of said at least one light blocking area, and S represents a size of a cross section of the laser beam incident on said optical element taken along a plane perpendicular to the central axis.

21. (Currently Amended) The scanning optical system according to claim 1, wherein said imaging optical system ~~is implemented by~~ comprises an optical system including a reflecting surface.

22. (Currently Amended) The scanning optical system according to claim 1, wherein said optical element further includes a shading part as an aperture stop, wherein said at least one light blocking area and said at least one light transmitting area are placed positioned in an aperture of said shading part.

23. (Currently Amended) A printer comprising a scanning optical system for dynamically deflecting a laser beam emitted from a light source by a deflecting system, converging the dynamically deflected laser beam by an imaging optical system into a spot beam on a scan target surface, and thereby scanning the spot beam in a main scanning direction on said scan target surface,
said scanning optical system including:

an optical element being placed positioned on an optical path between said light source and said deflecting system,

said optical element including:

a central area transmitting configured to transmit part of the laser beam ~~in the vicinity of at~~ a central axis of the laser beam;

at least one light blocking area blocking configured to block part of the laser beam incident on part of said optical element outside said central area; and

at least one light transmitting area transmitting configured to transmit part of the laser beam incident on part of said optical element other than said central area and said at least one light blocking area.